

**Review of the Internal Revenue
Service's Year 2000 End-to-End
System Integration Test Efforts -
Overall Planning and Execution of Test I**

April 1999

Reference Number: 094002



INSPECTOR GENERAL
for TAX
ADMINISTRATION

DEPARTMENT OF THE TREASURY
WASHINGTON, D.C. 20220

April 7, 1999

MEMORANDUM FOR COMMISSIONER ROSSOTTI

FROM: Lawrence W. Rogers /s/Lawrence W. Rogers
Acting Treasury Inspector General for Tax Administration

SUBJECT: Final Audit Report - Review of the Internal Revenue Service's
Year 2000 End-to-End System Integration Test Efforts - Overall
Planning and Execution of Test I

This report presents the results of our review of the Internal Revenue Service's (IRS) overall planning and execution of the Year 2000 end-to-end system integration test efforts for Test I.

Despite initial delays in the planning and conducting of end-to-end system integration test activities, IRS' Information Systems made significant progress in preparing an overall approach to conducting the test. In addition, the end-to-end system integration test team met their limited objectives for executing Test I. We did, however, identify the need for the IRS to prepare a systematic risk analysis of its systems and provide improved oversight over key support systems that will not be included in the IRS end-to-end test.

The Director, Office of Information Resources Management, did not agree to conduct a systematic risk assessment because all IRS mission critical systems will be subject to end-to-end testing. Since the IRS has allotted a three-month period for the actual end-to-end test of over 90 mission critical systems, we feel it would be prudent for the IRS to plan some alternative actions if either time or resources run short during the test period. The Director did agree to identify all key support systems not selected for the end-to-end system integration test. The Century Date Change Project Office has also established an end-to-end test team to provide technical coordination and support to system owners responsible for their own end-to-end testing.

We also identified the need for the IRS to better coordinate its planning efforts for the end-to-end system integration test. We recommended several ways in which the IRS could improve the end-to-end test planning, including the need to obtain formal commitments from necessary end-to-end system integration test partners in advance of future testing activities and improving project management efforts during the overall end-to-end system integration test planning effort. The Deputy Chief Information Officer for Information Resources Management indicated that they would formalize support

agreements by issuing Requests for Information Services, Memoranda of Understanding, and Service Level Agreements. They have also taken steps to improve the level of project communication and complete project documentation in more detail.

We also recommended that the IRS appoint an executive-level official solely dedicated to leading the end-to-end system integration test effort. The Deputy Chief Information Officer for Information Resources Management disagreed with this recommendation, responding that the end-to-end system integration test was progressing timely and the current management structure for the test is sufficient. IRS Management has taken several steps to mitigate the risk we identified, in part by establishing an end-to-end test team to provide technical support to system owners responsible for their own end-to-end testing and by identifying representatives within Operations responsible for coordinating Year 2000 compliance. We feel that these actions may not suffice to ensure that end-to-end testing efforts are given priority, especially when test activities require testing partners outside of Information Systems to take actions that conflict with their organizational interests. Without an executive-level official, completing a systematic risk assessment becomes more important.

Copies of this report are also being sent to IRS managers who are affected by the report recommendations. Please call me at (202) 622-6500 if you have any questions, or your staff may contact Maurice S. Moody, Acting Assistant Inspector General for Audit, at (202) 622-8500.

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Executive Summary

Within the Internal Revenue Service (IRS), the end-to-end system integration test serves as the final phase for assessing the Year 2000 (Y2K) compliance of its tax processing software, hardware, and communication suites. The IRS' Y2K end-to-end system integration test is being controlled by the Information Systems Product Assurance function, with significant levels of contractor support. The primary goal of the end-to-end system integration test is to create an off-line test environment that replicates IRS' tax processing environment. Planning for the end-to-end system integration test began in May 1998, and testing will run through December 1999.

The objective of our review was to assess the IRS' overall planning efforts for the Y2K end-to-end system integration test and to evaluate the effectiveness of Test I, which was conducted in July and August 1998. Test I was designed to provide a limited assessment of whether the IRS' systems software components, application components, and commercial off-the-shelf products will work through the year 2000.

Results

Despite initial delays in the planning and conducting of Y2K end-to-end system integration test activities, IRS Information Systems made significant progress in preparing an overall approach to conducting the test. In addition, the end-to-end system integration test team met their limited objectives for executing Test I. We did, however, identify the need for the IRS to prepare a systematic risk analysis of its systems and provide improved oversight for key support systems that will not be included in its Servicewide end-to-end test. We also identified the need for the IRS to better coordinate its planning efforts for the end-to-end system integration test.

The Internal Revenue Service Needs to Perform a Detailed Analysis and Risk Review of Its Systems to Support the End-to-End System Integration Test

The IRS' basis for selecting the systems included in the end-to-end system integration test was primarily judgmental. Management did not perform a detailed risk analysis or in-depth review of the systems prior to their selection. We identified several systems not selected for the end-to-end system integration test that have similar risk attributes to selected systems. The systems we identified are used to initiate updates to taxpayer accounts and, in some cases, could result in additional contacts with taxpayers. Although the systems to be included in the end-to-end system integration test have already been selected, a detailed analysis of the business value and potential risk exposure of all major IRS systems would provide benefit throughout the entire testing process.

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The Internal Revenue Service Needs to Improve Oversight of the End-to-End Testing of Key Systems Not Included in Its Servicewide Test

Additional management attention is needed to ensure key Operations support systems not selected for the coordinated end-to-end system integration test are identified and receive sufficient emphasis and testing resources. Presently, the owners of these systems are expected to perform their own testing based on instructions received from the Product Assurance function. There is no centralized oversight within the Operations area for this process.

Additional benefit could also be gained by mandating the use of the Product Assurance test bed for the review of all key Operations support systems not selected for coordinated testing. This would ensure these systems are analyzed for Y2K compliance in a secure and controlled environment.

Summary of Recommendations

To improve the end-to-end testing of its systems, we recommended that IRS management:

- Perform a detailed analysis of the IRS systems inventory to assess the business value and potential risk exposure of all its major systems and establish a priority ranking.
- Identify all key Operations support systems not selected for the nationally coordinated end-to-end system integration test.
- Establish centralized oversight and control over the testing of key support systems within the Operations functions.
- Mandate that key Operations systems owners use the Product Assurance test bed to perform their Y2K compliance testing.

Management's Response: *IRS management agreed to identify all key support systems not selected for the end-to-end system integration test. The Century Date Change Project Office has established an end-to-end test team to provide technical coordination and support to system owners responsible for their own end-to-end testing. The Project Office will coordinate with system owners to identify resource requirements, support the establishment and implementation of system test plans, assist with the identification and scheduling of test beds and test bed alternatives, and serve as the primary interface among testers, Product Assurance, Telecommunications and other teams which may influence the timeliness and success of the end-to-end testing.*

The Century Date Change Project Office did not agree to perform a detailed analysis of the business value and potential risk exposure of all major systems because all IRS systems will be end-to-end tested. They also did not agree that the use of the Product

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Assurance test bed should be mandated. Management's complete response to a draft of this report is included as Appendix IV.

Office of Audit Comments: Since IRS has allotted a three-month period from October 1, 1999, through December 31, 1999, to conduct the end-to-end test of over 90 mission critical systems, it would be prudent for IRS to plan some alternative actions if either time or resources run short to complete the test of all systems.

In a memorandum dated August 11, 1998, we also recommended that Information Systems take the following actions to improve the planning and execution of the end-to-end system integration test (management's response is denoted in *italics*).

- Use the Request for Information Services process or Memoranda of Understanding to obtain, prioritize, and allocate necessary end-to-end system integration test resources. *The Deputy Chief Information Officer for Information Resources Management stated that IRS would obtain such agreements for all future testing activities, as appropriate.*
- Oversee the development of more detailed end-to-end system integration test plans and schedules, and improve the level of Servicewide communication for the test effort. *The Deputy Chief Information Officer for Information Resources Management stated that project documentation would be completed in more detail, and that steps have been taken to improve the level of communication.*
- Develop and communicate Servicewide an end-to-end system integration test charter showing the members of the inter-organizational test team, the team's mission, and the team's roles and responsibilities. *The Deputy Chief Information Officer for Information Resources Management stated that IRS was completing a revised Century Date Change End-to-End Integration Testing Concept of Operations that will contain this type of information.*
- Consider appointing an executive solely dedicated to leading the end-to-end system integration test team. *The Deputy Chief Information Officer for Information Resources Management disagreed with this recommendation and stated that the end-to-end system integration test is progressing timely and in a coordinated effort, and that the current management structure for the end-to-end system integration test is sufficient.*

Office of Audit Comments: IRS Management has taken several steps to mitigate the risk we identified in our memorandum, including the establishment of an end-to-end test team to provide technical support to system owners responsible for their own end-to-end testing and the identification of representatives within Operations responsible for coordinating Y2K compliance. We believe that these actions may not suffice to assure that end-to-end testing efforts are given priority, especially when test activities may require testing partners outside of Information Systems to take actions

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that conflict with their organizational interests. The decision not to appoint an executive-level official heightens the importance of performing a detailed analysis of the IRS systems inventory to assess the business value and potential risk exposure of all its major systems and establishing a priority ranking.

The complete text of this memorandum and management's response are included as Appendices V and VI, respectively.

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Objective and Scope

The overall objective of this review was to assess the IRS' efforts to plan the overall Y2K end-to-end system integration test and to assess the execution of Test I.

The overall objective of this review was to perform an assessment of the overall planning for the Internal Revenue Service's (IRS) Year 2000 (Y2K) end-to-end system integration test efforts and to evaluate the execution of Test I. Audit work for this review was performed from June 1998 through October 1998. This review was conducted in accordance with generally accepted government auditing standards. Currently, we are conducting a review of the planning/execution of Test II and the planning for Test III. During this second end-to-end system integration test review, we will follow up on recommendations presented in this report.

Appendix I contains the detailed objectives, scope and methodology for this review. Management's response to a draft of this report is included in Appendix IV. A list of the major contributors to this report is presented in Appendix II.

Background

The upcoming century date change is one of the most pervasive problems facing the information systems community. To maximize system-processing capabilities and to preserve data storage space, many date fields in system components and applications have been limited to two-digit year representation (e.g., 97 for 1997). This problem is extremely critical to the IRS, as the majority of its tax processing functions are date driven.

Within the IRS, the end-to-end system integration test serves as the final phase for assessing the Y2K compliance of its tax processing software, hardware, and communication suites. The IRS' Y2K end-to-end system integration test is being controlled by the Information Systems Product Assurance function, with significant levels of contractor support. The primary

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goal of the end-to-end system integration test is to create an off-line test environment that replicates the IRS' tax processing environment, including the tax processing pipeline, tax processing support systems, electronic tax filing, the supporting hardware, and telecommunications infrastructure. Test I was designed to provide a limited assessment of whether the IRS' systems software components, application components, and commercial off-the-shelf products will work through the year 2000.

Results

The end-to-end system integration test team worked very diligently and met their objectives for Test I.

Despite initial delays in the planning and conducting of the testing efforts, Information Systems made significant progress in preparing an overall approach to conducting the Y2K end-to-end system integration test. In addition, the test team worked very diligently and met the limited objectives they had set for Test I.

However, key aspects of the end-to-end system integration test, specifically Test II (October 1998 - February 1999) and Test III (February 1999 - December 1999) still need to be performed. In addition, as Product Assurance officials have made clear, the success of the end-to-end system integration test cannot be fully assessed until December 1999, after the 2000 Filing Season applications have been tested.

We identified several issues that need to be addressed to assure that all IRS systems, whether included in the end-to-end system integration test or not, are adequately tested prior to January 1, 2000. These issues have been categorized into the following two recommendations.

We identified several end-to-end system integration test issues that needed to be resolved.

- The IRS needs to perform a detailed analysis and risk review of its systems to support the end-to-end system integration test.
- The IRS needs to improve oversight of the end-to-end testing of key systems not included in its Servicewide test.

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We also identified various ways in which the IRS needs to improve the coordination of its planning efforts for the end-to-end system integration test. These concerns were communicated to management in a memorandum dated August 11, 1998. The issues discussed in the memorandum are summarized at the end of the report.

The Internal Revenue Service Needs to Perform a Detailed Analysis and Risk Review of Its Systems to Support the End-to-End System Integration Test

Product Assurance selected the systems to be included in the end-to-end system integration test. These systems were selected primarily on a judgmental basis. Management did not perform a detailed risk analysis or in-depth review of the systems prior to their selection. We identified several systems not selected for the end-to-end system integration test that have similar risk attributes to selected systems. The systems we identified are used to initiate updates to taxpayer accounts and, in some cases, could result in additional contacts with taxpayers. There is no documentation regarding why these systems were not selected.

A detailed analysis of the business value and potential risk exposure of all major IRS systems would provide benefit throughout the entire end-to-end test process.

Although the systems to be included in the coordinated test have already been selected, a detailed analysis of the business value and potential risk exposure of all major IRS systems would provide benefit throughout the entire end-to-end test process. Ongoing benefits of this analysis would include the ability to:

- Prioritize the end-to-end system integration testing being coordinated by the Product Assurance function, which could be critical in the event of unforeseen difficulties or schedule slippage.
- Establish precedence for the testing of systems not selected for the Product Assurance coordinated test, which would ensure systems with a higher business value receive priority access to limited resources.

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- Identify all key Operations support systems not selected for testing.

Recommendation

1. The Chief Information Officer should perform a detailed analysis of the business value and potential risk exposure of all major IRS systems and establish a priority ranking.

Management's Response: The Century Date Change Project Office does not agree with the recommendation. A priority ranking for each system does not need to be implemented because all IRS systems will be end-to-end tested.

Office of Audit Comments: The IRS has allotted a three-month period from October 1, 1999, through December 31, 1999, to conduct the end-to-end test of over 90 mission critical systems. Priority ranking of each system would show where to apply resources if either time or resources run short to complete the test of all systems. In lieu of the decision not to prioritize each system, it would be prudent for the IRS to plan some alternative actions.

The Internal Revenue Service Needs to Improve Oversight of the End-to-End Testing of Key Systems Not Included in Its Servicewide Test

Additional IRS management attention is needed to ensure key Operations support systems, not selected for the coordinated end-to-end system integration test, are identified and receive sufficient emphasis and resources. Presently, the owners of these systems are expected to perform their own testing based on instructions received from the Product Assurance function. There is no centralized oversight within Operations for this process.

Some of the key Operations systems not selected for the coordinated end-to-end system integration test include

There is no centralized oversight for the end-to-end system integration test within the Operations area.

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Additional benefit to IRS' Y2K conversion effort could be obtained by mandating the use of the Product Assurance test bed for the review of all key Operations support systems not selected for coordinated testing.

those responsible for controlling cases and initiating transactions related to the processing of Exempt Plans and Exempt Organization (EP/EO) Determinations, Bankruptcies, and Offers in Compromise.

Systems not included in the coordinated end-to-end system integration test are expected to be tested locally for Y2K compliance using instructions prepared by the Product Assurance function. These instructions were not finalized until December 31, 1998.

Additional benefit to the IRS' Y2K conversion effort could be obtained by mandating the use of the Product Assurance test bed for the review of all key Operations support systems not selected for coordinated testing. This would ensure these systems are analyzed for Y2K compliance in a secure and controlled environment. Use of the Product Assurance test bed for non-selected systems is currently optional for the system owners whose systems are not included in the end-to-end system integration test.

Recommendations

2. The Chief Information Officer should identify all key Operations support systems not selected for the nationally coordinated end-to-end system integration test.

Management's Response: The Century Date Change Project Office has identified the following Operations systems to be end-to-end tested by the system owners:

- Automated Quarterly Excise Tax Listing (QETL)
- Automated Criminal Investigation (ACI)
- Auto Insolvency System/Insolvency Input Program (AIS/IIP)
- Automated Workload Control System for Special Procedures Inventory (AWCS)
- EP/EO Determination System (EP/EO System)
- Excise Tax Cell Phone System (Ex-Phone)
- Excise Tax Tracking System (ExTRAS)
- Exam Management Information System for Large Cases (CEMIS)
- Midwest Audit Classification System (MACS)
- Computer Assisted Publishing System (CAPS)

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- Compliance Research Initiative Tracking System (CRITS)
- Electronic Transcript Delivery System (ETDS)
- Statistics of Income-Distributive Processing System (SOI)

The Century Date Change Project Office has established an end-to-end test team to provide technical coordination and support to system owners responsible for their own end-to-end testing. Key operations systems and system owners have been identified on the Century Date Change Project Office Systems List, and end-to-end test commitments and resource requirements are being obtained from system owners. The Century Date Change Project Office team will coordinate with system owners to identify resource requirements, support the establishment and implementation of system test plans, assist with the identification and scheduling of test bed and test bed alternatives, and serve as the primary interface among testers, Product Assurance, Telecommunications and other teams which may influence the timeliness and success of end-to-end testing.

3. IRS management should establish within the Operations function centralized oversight and control over the testing of key support systems.

Management's Response: Operations has identified representatives for coordinating and reporting Y2K compliance activities and issues between the system owners and the Century Date Change Project Office. The Century Date Change Project Office team will coordinate with Product Assurance to provide technical guidance and training to system owners as necessary.

4. The Chief Information Officer should mandate that key Operations systems owners use the Product Assurance test bed to perform their Y2K compliance testing.

Management's Response: The Century Date Change Project Office and Assistant Commissioner (Product Assurance) do not agree that the use of a Product Assurance test bed should be mandated. However, the Century Date Change Project Office will coordinate

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closely the scheduling of controlled test beds between systems owners and Product Assurance and has established an end-to-end test team to provide technical coordination and support to system owners responsible for their own end-to-end testing. The team will work closely with system owners and Product Assurance to schedule the controlled test beds for system owner testing wherever possible.

Other options for testing a controlled environment will also be explored on a case by case basis. System owners may be able to use the test facility normally used for system testing. Production platforms may also be scheduled for test time during scheduled system down times, before or after preventive maintenance periods, or by scheduling off-shift operations. In addition, test time may be able to be leased or purchased on third party test facilities.

Office of Audit Comments: We concur that this alternative approach addresses our recommendation.

**Issues Reported during the Review and
Responded to by Internal Revenue Service
Management**

*We assessed the initial
planning efforts for the end-to-
end system integration test
and the execution of Test I.*

During our review, we assessed the initial planning efforts for the Y2K end-to-end system integration test and the execution of Test I. In an audit memorandum dated August 11, 1998, we made the following recommendations to improve the overall planning and execution of the end-to-end system integration test (management's response is denoted in *italics*):

- Information Systems should obtain formal agreements from testing partners for future testing activities for the field and customer functions. *The Deputy Chief Information Officer for Information Resources Management stated that for all future testing activities, they would issue Requests for Information Services, Memoranda of Understanding,*

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and Service Level Agreements, as appropriate, with project partners to formalize support agreements.

- Information Systems should oversee the development of more detailed project plans and schedules. *The Deputy Chief Information Officer for Information Resources Management stated that project documentation would be completed in more detail, and that steps had already been taken to improve the level of project communication.*
- The IRS needs to formally identify an end-to-end system integration test inter-organizational team that has representatives from all key testing partners, including field and customer organizations. The mission, roles, and responsibilities of this team should be communicated throughout the IRS in the form of an end-to-end system integration test team charter. *The Deputy Chief Information Officer for Information Resources Management stated that they were completing a revised Century Date Change End-to-End Integration Testing Concept of Operations, which will provide the information we requested.*

The Deputy Chief Information Officer for Information Resources Management did not agree with our recommendation that an executive level official be appointed to ensure the end-to-end system integration test effort is given sufficient priority in light of other IRS commitments

- Information Systems should consider appointing an executive level official to provide the authority for ensuring that the end-to-end system integration test effort is given sufficient priority in light of other IRS commitments. *The Deputy Chief Information Officer for Information Resources Management disagreed with this recommendation and felt the end-to-end system integration test was progressing timely and in a coordinated effort, and that the current management structure for the end-to-end system integration test is sufficient.*

Office of Audit Comments: Recommendations number 2 and 3 in this report are directed at assuring that adequate end-to-end testing is performed for all mission critical systems, not just those included in the end-to-end system integration test. IRS Management has taken several steps to mitigate the

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risk we identified in our memorandum, in part by establishing an end-to-end test team to provide technical support to system owners responsible for their own end-to-end testing and by identifying representatives within Operations responsible for coordinating Y2K compliance. We believe that these actions may not suffice to assure that end-to-end testing efforts are given priority, especially when test activities may require testing partners outside of Information Systems to take actions that conflict with their organizational interests.

Because IRS management decided not to name an executive-level official, we recommend that the IRS reconsider its decision not to rank and prioritize each system to ensure resources are efficiently used. This relates to recommendation number 1 in the report.

The memorandum and management's response are included as Appendices V and VI, respectively.

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Appendix I

Detailed Objectives, Scope and Methodology

The objective of this review was to assess the Internal Revenue Service's (IRS) overall planning efforts for the Year 2000 (Y2K) end-to-end system integration test and to evaluate the effectiveness of Test I, which was conducted in July and August 1998. Test I was designed to provide a limited assessment of whether the IRS' systems software components, application components, and commercial off-the-shelf (COTS) products will work through the year 2000. Specifically, we:

- I. Reviewed the IRS' overall end-to-end system integration test planning documentation to determine if the information sufficiently and completely documents all necessary testing activities and the necessary level of coordination between involved functional areas by:
 - A. Interviewing the necessary Information Systems officials (e.g., Product Assurance, Y2K Telecommunications Project Office, Office of Technical Support, etc.) and reviewing necessary documentation to determine if the items were in fact completed when scheduled, as items in the planning documents reached scheduled completion dates.
 - B. Assessing the impact on the overall testing effort and the IRS' Y2K conversion efforts if planning items did not meet established deadlines.
 - C. Assessing the plans in place for testing external trading partner related components to help determine if the IRS' trading partner issues were sufficiently addressed.
 - D. Reviewing the coordination and planning efforts for systems that were not part of the 93 tax processing systems being tested.
 - E. Evaluating the IRS' methodology for performing a risk assessment of tax processing systems and identifying the ones to be included in the test. For the systems not included in the system test, we assessed the level of guidance and support provided by Product Assurance to the areas responsible for testing the systems.
 - F. Reviewing Configuration Management efforts to ensure that components being tested were adequately controlled. This included the access, modification, documentation, and storage of tested components.
- II. Evaluated the establishment of the test platforms to determine if the parallel-processing environment would be ready to run tests by:

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- A. Evaluating the level of operating responsibility Product Assurance had accepted for the testing sites (Detroit Computer Center, Martinsburg Computer Center, Tennessee Computer Center, and National Office) to determine if Product Assurance had the appropriate authority and staffing for operating the test platforms.
 - B. Determining how the IRS' delays in fully assessing the Y2K impact of telecommunications would affect the establishment of the test platforms.
 - C. Reviewing the test system settings (via visit or remotely) to ensure that the systems clocks had in fact been set to the year 2000.
- III. Observed Test I activities and reviewed results to determine if the test provided the IRS with assurance that its system software, applications, telecommunications, and COTS products would operate correctly in the year 2000.
- IV. Determined if TRW, Inc. was providing the IRS with the services required in the contract for the IRS' end-to-end system integration test effort by:
- A. Reviewing the Statement of Work and deliverables for the end-to-end system integration test effort to identify the services TRW, Inc. was required to provide and if they were providing them.
 - B. Interviewing the Technical Point of Contact for more specifics on the work expected from TRW, Inc.

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Appendix II

Major Contributors to This Report

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Appendix III

Report Distribution List

Deputy Commissioner Operations OP
Chief Operations Officer OP
Chief Management and Finance M
Chief Information Officer IS
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Assistant Commissioner, Research and Statistics of Income OP:RS
Director, Century Date Change Program Office IS:CD
National Director for Legislative Affairs CL:LA
Office of Management Controls M:CFO:A:M

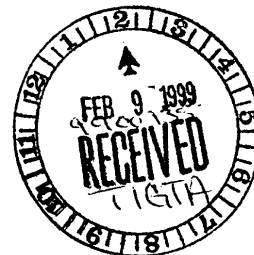
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Appendix IV



DEPARTMENT OF THE TREASURY
INTERNAL REVENUE SERVICE
WASHINGTON, D.C. 20224

FEB 1 1999



MEMORANDUM FOR TREASURY INSPECTOR GENERAL FOR
TAX ADMINISTRATON

FROM:

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Director, Office of Information Resources Management IS:IR

SUBJECT:

Review of the Service's Year 2000 End-to-End System
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Test 1

The Director, Year 2000 Program, and the Assistant Commissioner for Product Assurance have reviewed the subject draft Internal Audit Report and provide the attached management response.

If you have any questions, please call me on (202) 283-4060, or have a member of your staff call Donna Downing on (202) 283-4159.

Attachment

cc: Assistant Chief Inspector (Internal Audit)
Deputy Director, Office of Audit Projects

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Attachment

**Review of the Service's Year 2000 End-to-End
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Recommendation # 1

Service management should perform a detailed analysis of the business value and potential risk exposure of all major Service systems and establish a priority ranking.

Assessment of Cause

The Century Date Change Project Office does not agree with the recommendation. A priority ranking for each system does not need to be implemented because all IRS systems will be end-to-end tested.

Corrective Action # 1

No corrective action is necessary because all IRS systems are required to be end-to-end tested by December 31, 1999.

Implementation Date for Corrective Action # 1

Completed:

Proposed:

Responsible Official for Corrective Action # 1

Chief Information Officer IS
Deputy Chief Information Officer (Systems) IS
Assistant Commissioner, Product Assurance IS:PA

**Review of the Internal Revenue Service's Year 2000 End-to-End
System Integration Test Efforts -
Overall Planning and Execution of Test I**

Attachment

**Review of the Service's Year 2000 End-to-End
System Integration Test Efforts -
Overall Planning and Execution of Test 1**

Recommendation # 2

Identify all key Operations support systems not selected for the nationally coordinated End-to-End System Integration Test.

Assessment of Cause

At the time that Internal Audit conducted the Review of the Service's Year 2000 End-to-End System Integration Test Efforts, Operations support systems had not been identified for end-to-end testing. All IRS systems will be end-to-end tested. The Century Date Change Project Office has identified the following Operations systems to be end-to-end tested by the system owners:

Automated Quarterly Excise Tax Listing System (QETL)
Automated Criminal Investigation (ACI)
Auto Insolvency System / Insolvency Input Program (AIS/IIP)
Automated Workload Control System for Special Procedures Inventory (AWCS)
EP/EO Determination System (EP/EO System)
Excise Tax Cell Phone System (Ex-Phone)
Excise Tax Tracking System (ExTRAS)
Exam Management Information System for Large Cases (CEMIS)
Midwest Audit Classification System (MACS)
Computer Assisted Publishing System (CAPS)
Compliance Research Initiative Tracking System (CRITS)
Electronic Transcript Delivery System (ETDS)
Statistics of Income-Distributive Processing System (SOI)

Any additional systems identified in the decomposition of mission support will be tested as well.

Corrective Action # 2

The Century Date Change Project Office has established an end-to-end test team to provide technical coordination and support to system owners responsible for their own end-to-end testing. Key Operations systems and system owners have been identified on the Century Date Change Project Office Systems List, and end-to-end test commitments and resource requirements are being obtained from system owners.

**Review of the Internal Revenue Service's Year 2000 End-to-End
System Integration Test Efforts -
Overall Planning and Execution of Test I**

Attachment

**Review of the Service's Year 2000 End-to-End
System Integration Test Efforts -
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Corrective Action # 2 (Continued)

The Century Date Change Project Office team will coordinate with system owners to identify resource requirements, support the establishment and implementation of system test plans, assist with the identification and scheduling of test beds and test bed alternatives, and serve as the primary interface between testers, Product Assurance, Telecommunications and other teams which may influence the timeliness and success of end-to-end testing.

The Century Date Change Project Office team will coordinate with Product Assurance to provide technical guidance and training to system owners as necessary.

A joint memorandum, "Test Procedures For End-To-End Testing By System Owners," was issued by the Century Date Change Project Office and Product Assurance on December 31, 1998.

Implementation Date for Corrective Action # 2

Completed: November 22, 1998

Century Date Change Project Office employees assigned to system owner E2E testing; contractor support statement of work prepared and issued and contractor staffing initiated.

Proposed:

Responsible Official for Corrective Action # 2

Chief Information Officer IS
Deputy Chief Information Officer (Systems) IS
Assistant Commissioner, Product Assurance IS:PA

**Review of the Internal Revenue Service's Year 2000 End-to-End
System Integration Test Efforts -
Overall Planning and Execution of Test I**

Attachment

**Review of the Service's Year 2000 End-to-End
System Integration Test Efforts -
Overall Planning and Execution of Test 1**

Recommendation # 3

Establish within the Operations function centralized oversight and control over the testing of key support systems.

Assessment of Cause

Key Operations support systems not selected for end-to-end testing by Product Assurance are at risk. System owners are responsible for independently conducting end-to-end system testing without the benefit of centralized resources and facilities.

Corrective Action # 3

Operations has identified representatives for coordinating and reporting Year 2000 compliance activities and issues between the system owners and the Century Date Change Project Office.

The Century Date Change Project Office has established an end-to-end test team to provide technical coordination and support to system owners responsible for their own end-to-end testing.

The Century Date Change Project Office team will coordinate with system owners to identify resource requirements, support the establishment and implementation of system test plans, assist with the identification and scheduling of test beds and test bed alternatives, and serve as the primary interface between testers, Product Assurance, Telecommunications and other teams which may influence the timeliness and success of end-to-end testing.

The Century Date Change Project Office team will coordinate with Product Assurance to provide technical guidance and training to system owners as necessary.

Implementation Date for Corrective Action # 3

Completed: November 22, 1998
Century Date Change Project Office employees assigned to system owner E2E testing; contractor support statement of work prepared and issued and contractor staffing initiated.

Proposed:

**Review of the Internal Revenue Service's Year 2000 End-to-End
System Integration Test Efforts -
Overall Planning and Execution of Test I**

Attachment

**Review of the Service's Year 2000 End-to-End
System Integration Test Efforts -
Overall Planning and Execution of Test 1**

Responsible Official for Corrective Action # 3

Chief Information Officer IS
Deputy Chief Information Officer (Systems) (IS)
Assistant Commissioner, Product Assurance IS:PA
Director, Century Date Change Project Office IS:CD

**Review of the Internal Revenue Service's Year 2000 End-to-End
System Integration Test Efforts -
Overall Planning and Execution of Test I**

Attachment

**Review of the Service's Year 2000 End-to-End
System Integration Test Efforts -
Overall Planning and Execution of Test 1**

Recommendation # 4

Mandate that key Operations systems owners use the Product Assurance test bed to perform their Year 2000 compliance testing.

Assessment of Cause

The Century Date Change Project Office and Assistant Commissioner (Product Assurance) do not agree that the use of a Product Assurance test bed should be mandated. However, the Century Date Change Project Office will coordinate closely the scheduling of controlled test beds between systems owners and Product Assurance.

Other options for testing in a controlled environment will be explored on a case by case basis. System owners may be able to use the test facility normally used for system testing. Production platforms may also be scheduled for test time during scheduled system down times, before or after preventive maintenance periods, or by scheduling off-shift operations. In addition, test time may be able to be leased or purchased on third party test facilities.

Corrective Action # 4

The Century Date Change Project Office has established an end-to-end test team to provide technical coordination and support to system owners responsible for their own end-to-end testing. The team will work closely with system owners and PA to schedule the controlled test beds for system owner testing wherever possible.

Implementation Date for Corrective Action # 4

Completed: November 22, 1998
Century Date Change Project Office employees permanently assigned to system owner E2E testing; contractor support statement of work prepared and issued and contractor staffing initiated.

Proposed:

**Review of the Internal Revenue Service's Year 2000 End-to-End
System Integration Test Efforts -
Overall Planning and Execution of Test I**

Attachment

**Review of the Service's Year 2000 End-to-End
System Integration Test Efforts -
Overall Planning and Execution of Test 1**

Responsible Official for Corrective Action # 4

Chief Information Officer IS
Deputy Chief Information Officer (Systems) IS
Assistant Commissioner, Product Assurance IS:PA
Director, Century Date Change Project Office IS:CD

**Review of the Internal Revenue Service's Year 2000 End-to-End
System Integration Test Efforts -
Overall Planning and Execution of Test I**

Appendix V

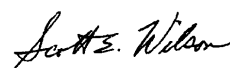


**DEPARTMENT OF THE TREASURY
INTERNAL REVENUE SERVICE
WASHINGTON, D.C. 20224**

August 11, 1998

**Response Date:
August 20, 1998**

**MEMORANDUM FOR ACTING ASSOCIATE COMMISSIONER FOR
MODERNIZATION/CHIEF INFORMATION OFFICER**

FROM: Scott E. Wilson 
Acting Assistant Chief Inspector (Internal Audit)

SUBJECT: Review of the Service's Year 2000 End-to-End System
Integration Test (Overall Planning and Test I) -
Memorandum #1

Internal Audit is performing an on-line review of the Service's Year 2000 End-to-End System Integration Test effort. During our review, we have determined that the Service needs to have a more coordinated planning effort for the End-to-End System Integration Test. The audit work supporting this issue was conducted in accordance with generally accepted government auditing standards.

If you do not agree with the facts, conclusions, or recommendations presented in this memorandum, please contact my office within five workdays. We believe the 10 workday response due date for this memorandum is necessary because of the time criticality of the Century Date Change issue. If you have any questions concerning this memorandum, please contact me or Margaret Begg, Director of the Office of Audit Projects, at 703/235-4200.

Results

The Service's Year 2000 End-to-End System Integration Test is being controlled by the Information Systems Product Assurance function, with significant levels of contractor support. The primary goal of the Year 2000 End-to-End System Integration Test is to create an off-line test environment that replicates the Service's tax processing environment, including the tax processing

Review of the Internal Revenue Service's Year 2000 End-to-End System Integration Test Efforts - Overall Planning and Execution of Test I

- 2 -

pipeline, tax processing support systems, electronic tax filing, and the supporting hardware and telecommunications infrastructure. Planning for the End-to-End System Integration Test began in May 1998, and testing will run to December 1999. The test is ultimately intended to prove that tax-processing applications will perform correctly on and after 01/01/2000. The initial phase of the test (Test I) is being conducted at the Martinsburg Computing Center (MCC) and the Tennessee Computing Center (TCC) during July/August 1998.

During our review of the Service's End-to-End System Integration Test effort, we have identified several issues that should be addressed in advance of future testing activities.

During our preliminary assessment of the Year 2000 End-to-End System Integration Test, we have found that the Product Assurance Test Team is working very diligently, under tight timeframes, to deliver the testing effort. However, we have identified the following issues that we believe need to be addressed:

- Formal commitments from the necessary End-to-End System Integration Test partners should be obtained in advance of future testing activities.
- Project management efforts during the overall End-to-End System Integration Test planning effort can be improved.
- The End-to-End System Integration Test Team should be formally identified and a Team Charter should be prepared and disseminated Servicewide.
- The End-to-End System Integration Test Team should be led by an executive official solely dedicated to the testing effort.

Review of the Internal Revenue Service's Year 2000 End-to-End System Integration Test Efforts - Overall Planning and Execution of Test I

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Formal commitments from the necessary End-to-End System Integration Test partners should be obtained in advance of future testing activities.

The Service should use formal agreements among testing partners to obtain the commitments necessary for the End-to-End System Integration Test.

No formal agreements have been made between the necessary parties for any phases of the End-to-End System Integration Test. For Test I, the critical partners are Product Assurance, the Office of Technical Support, MCC, and TCC. The agreements made among these partners in advance of Test I were informal, which we believe led to Test I delays at TCC. For example:

- Due to other Service priorities, including Service Center mainframe consolidation, there has been little technical support available to assist the Test Team in establishing the Unisys 2200 test environment at TCC. Despite this lack of support, the Unisys 2200 test bed has been established, but only after significant testing delays.
- Access requirements for the TCC test system were not fully addressed in advance of testing, resulting in the Test Team's inability to fully access the system and diagnose problems with data runs.

These types of issues may be avoided in the future if formal agreements (i.e. Requests for Information Services, Memorandums of Understanding) between End-to-End System Integration Test partners are used to identify, prioritize, and allocate the necessary services and resources.

Test I of the End-to-End System Integration Test is focused on identifying Year 2000 problems with systems software components and Commercial Off the Shelf (COTS) products. The main test of the actual tax-processing environment will occur during Test II (November 1998) and Test III (February 1999). For all three phases of the test, continuing support will be required to configure and maintain test bed environments, load system software and database information, ensure local and remote system access, and provide telecommunications infrastructure.

Review of the Internal Revenue Service's Year 2000 End-to-End System Integration Test Efforts - Overall Planning and Execution of Test I

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The need for formal agreements among testing partners will be even more important as the testing activities progress.

The need for formal agreements on future testing activities are already being identified. For example:

- The Product Assurance Integrated Test and Control Center (ITCC) is tasked with hosting several Tier II platforms needed for Test II (November 1998) and Test III (February 1999), but ITCC officials have stated that they will not be able to provide full support for the Tier II systems undergoing end-to-end testing. As a result, the Service will need to arrange resources to support the Tier II portion of Test II and Test III.
- Due in part to mainframe consolidation requirements, support from the Office of Technical Support will be extremely limited in future testing activities. Therefore, the Service needs to identify and obtain the End-to-End System Integration Test resources needed to support system software and database activities.

The General Accounting Office's *Year 2000 Computing Crisis: A Testing Guide* lists key processes that should be in place for an end-to-end Year 2000 test. One of these processes is to secure the commitment of key partners. In addition, the General Accounting Office's testing guide states that milestones and resources (personnel, facilities, and tools) should be secured, and the responsibility for performing key tasks be assigned.

Recommendation

1. Information Systems should obtain formal agreements from testing partners for future testing activities. These agreements should be used to identify, prioritize, and allocate necessary resources. The agreements may be RISs for the Information Systems functions, or Memorandums of Understanding for the field and customer functions.

Review of the Internal Revenue Service's Year 2000 End-to-End System Integration Test Efforts - Overall Planning and Execution of Test I

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Project management efforts for the End-to-End System Integration Test can be improved.

Project management efforts for the End-to-End System Integration Test can be improved.

The Year 2000 End-to-End System Integration Test is a significant effort for the Service, as it encompasses 93 of the Service's 137 major processing systems and requires significant hardware, software, and telecommunications support from many Service functions. Key components of successful project management for an effort such as the End-to-End System Integration Test are the development of detailed planning documents and effective communication across the entire organization. We noted that initial project management efforts for the End-to-End System Integration Test, including efforts to develop detailed plans and to communicate testing information organization-wide, could be improved.

We reviewed several End-to-End System Integration Tests planning documents, and found that the documents were completed at a high level, with few detailed tasks. For example:

- We reviewed the July 10, 1998, *Century Date Change End-to-End Integration Testing Risk Management Plan*, and found that the document defines the Risk Management Process and the Risk Management Organization, but it does not identify specific risks or mitigation strategies for the End-to-End System Integration Test effort. The End-to-End System Integration Test Team has made many critical assumptions for the test effort, including having availability of the new Communication Replacement System (CRS) and the Unisys 4800 test bed, but these assumptions are not identified in the *Risk Management Plan*. If these and other critical assumptions are not realized, the End-to-End System Integration Test could be significantly impacted.

The End-to-End System Integration Test Team is tracking detailed risks and issues in the contractor developed Risk and Issues Database (RAID). We believe this is a positive activity, but the *Risk Management Plan* should be used to consolidate

Review of the Internal Revenue Service's Year 2000 End-to-End System Integration Test Efforts - Overall Planning and Execution of Test I

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these detailed risks and issues into key End-to-End System Integration Test risk areas for which overall mitigation strategies can be developed.

The Service's End-to-End System Integration Test planning documents should be updated to reflect the Year 2000 compliance of Tier II platforms scheduled for end-to-end testing.

- We reviewed the July 10, 1998 *Century Date Change End-to-End Integration Testing Concept of Operations* and *Century Date Change End-to-End Integration Testing Hardware and Software Test Bed Plan*, and the July 15, 1998, *End-to-End System Integration Test Program Management Plan*. We found that the documents do not provide detailed plans or schedules for incorporating the Year 2000 compliance of the Service's Tier II platforms into the testing effort. This planning activity is critical because of the 93 major Service systems undergoing end-to-end testing, 25 (27%) are completely or partially hosted on Tier II platforms. As a result, the availability of Year 2000 Tier II testing platforms needs to be incorporated into the End-to-End System Integration Test planning documents.

The end-to-end testing of the Consolidated Mail Processing System (COMPS) is another example of where more detailed Tier II testing plans are necessary. COMPS are scheduled to be tested in Test II (November 1998) and Test III (February 1999) of the End-to-End System Integration Test. However, the system is scheduled to be replaced by the Service Center Composite Mail Processing System (SCAMPS) by the Year 2000, and there are no scheduled SCAMPS implementation dates for any of the scheduled End-to-End System Integration Test sites (MCC, TCC, and ITCC). As a result, it is unclear from the End-to-End System Integration Test planning documents how COMPS/SCAMPS will be tested as part of the end-to-end test.

A General Accounting Office key process for end-to-end testing states that testing tasks and requirements should be defined. We believe the Service's End-to-End System Integration Test planning documents, including the *Risk Management Plan*, *Program Management Plan*, *Concept of Operations*, and *Hardware and Software Test Bed Plan* should be defined at a more detailed level.

Review of the Internal Revenue Service's Year 2000 End-to-End System Integration Test Efforts - Overall Planning and Execution of Test I

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Communication efforts for the Year 2000 End-to-End System Integration Test can be improved.

Another key component of successful project management is effective communication among project members. We noted that communication efforts for the End-to-End System Integration Test could be improved. For example:

- The Office of Technical Support, one of the key players in the establishment of the Test I test bed, was not consulted on the development of the initial version of the Test I Plan. The Office of Technical Support's input to such test documents could be critical, as they can provide insight on how to run system jobs and interpret system activities. After this issue was identified during a bi-weekly Year 2000 Certification/End-to-End System Integration Test meeting on July 21, 1998, the Office of Technical Support was asked for input to the Test I Plan.
- The Office of Technical Support maintains procedures for advancing the Unisys 2200-system clock to the Year 2000. However, those procedures were not provided to the End-to-End Test team until July 21, 1998, because the Office of Technical Support was not aware that the Test Team needed the procedures, and the Test Team was not aware the Office of Technical Support maintained the procedures.

Enhanced levels of communication are needed for the End-to-End System Integration Test to ensure accurate and effective information is being reported among the Test Team, Service executives, and external stakeholders.

Although the Test Team has been working these types of communications related issues as they arise, the problems may have been addressed earlier in the process if communication lines were more open.

Product Assurance has initiated steps to improve the level of proactive communication for the testing effort. For example, an End-to-End System Integration Test "kick off" session is scheduled for August 13, 1998. The intent of this meeting is to have End-to-End System Integration Test participant's report on the testing dependencies for which they are responsible. We believe this type of communication effort is positive, and should be continued to help enhance communication

Review of the Internal Revenue Service's Year 2000 End-to-End System Integration Test Efforts - Overall Planning and Execution of Test I

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for the overall testing effort and to ensure that accurate and effective information is being reported among the Test Team, Service executives, and external stakeholders.

Recommendations

Information Systems should:

2. Oversee the development of more detailed End-to-End System Integration Test plans and schedules. This should include, at a minimum, a *Risk Management Plan* that presents key testing risk areas and mitigation strategies, and plans that reflect the Year 2000 compliance of the Service's Tier II platforms and how the platforms' compliance will impact the End-to-End System Integration Test.
3. Improve communications between End-to-End System Integration Test partners through increased awareness of and interaction at Year 2000 End-to-End Test meetings and discussions.

The End-to-End System Integration Test Team should be formally identified and a Team Charter should be prepared and disseminated Servicewide.

Servicewide communication of the End-to-End System Integration Test Team Charter is necessary to ensure sufficient awareness and accountability for the testing effort.

The criticality and magnitude of the Service's Year 2000 End-to-End System Integration Test requires a very coordinated Servicewide effort. The testing effort will require input and support from the Information Systems organization and field and customer organizations. As a result, we believe the Service needs to formally identify an End-to-End System Integration Test inter-organizational team that has representatives from all key testing partners, including field and customer organizations. The mission, roles, and responsibilities of this team should be communicated Servicewide in the form of an End-to-End System Integration Test Team Charter. We believe the Servicewide communication of

Review of the Internal Revenue Service's Year 2000 End-to-End System Integration Test Efforts - Overall Planning and Execution of Test I

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this Test Charter is necessary to ensure sufficient awareness and accountability for the testing effort.

A General Accounting Office key process for Year 2000 end-to-end testing is the establishment of an inter-organizational end-to-end test team composed of representatives to manage the planning, execution, and reporting of the test. In addition, the General Accounting Office's Year 2000 testing guide states that milestones and resources (personnel, facilities, and tools) be secured, and the responsibility for performing key tasks be assigned.

The Service has initiated efforts to establish an inter-organizational test team. For example:

- Several End-to-End System Integration planning documents, including the *Program Management Plan* and *Concept of Operations* list the organizations that are participating in the test (i.e. Information Systems Operations, Service Centers, Computing Centers, Contractors), and also list these organizations' high level responsibilities for the test effort.
- During a meeting with Product Assurance officials on July 27, 1998, we were informed that Product Assurance has established Points of Contact in the Regional Directors of Information Systems (RDIS) offices and established contact with Year 2000 coordinators in the field offices.

There is a need to develop a more detailed listing of team members and their specific roles and responsibilities, and to communicate this information Servicewide.

These efforts are positive steps, but we believe there is a need to develop a more detailed listing of team members and their specific roles and responsibilities, and to communicate this information Servicewide to help raise awareness of the testing effort and to provide a detailed level of accountability over testing activities.

Review of the Internal Revenue Service's Year 2000 End-to-End System Integration Test Efforts - Overall Planning and Execution of Test I

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Recommendation

4. Information Systems should develop an End-to-End System Integration Test Charter showing the members of the inter-organizational test team, the team's mission, and the team's roles and responsibilities. The team should consist of the key representatives from each of the partnering areas needed to effectively plan and conduct the End-to-End System Integration Test. The Team Charter should be communicated Servicewide to ensure awareness and accountability for the testing effort.

The End-to-End System Integration Test Team should be led by an executive official solely dedicated to the testing effort.

We believe the Service's inter-organizational End-to-End System Integration Test Team should be led by an executive official, dedicated solely to the end-to-end test effort. During this testing effort, there will be a need for extensive cross-functional authority and Servicewide communication. Projects of this magnitude can be difficult to implement through the use of a matrixed management approach.

Activities required during end-to-end testing may warrant testing partners to take actions that conflict with their organizational interests. In addition, we anticipate there may be activities required during end-to-end testing that warrant testing partners to take actions that conflict with their organizational interests, but are necessary for the End-to-End System Integration Test. As a result, an executive level official may be needed to provide the authority for ensuring that the End-to-End System Integration Test effort is given sufficient priority in light of other Service commitments.

During a meeting on July 27, 1998, Product Assurance officials stated that the Director, Product Assurance has been tasked as the executive leader for the End-to-End System Integration Test effort. However, we are

Review of the Internal Revenue Service's Year 2000 End-to-End System Integration Test Efforts - Overall Planning and Execution of Test I

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concerned that because of the magnitude of the End-to-End System Integration Test, coupled with the many other significant priorities currently assigned to Product Assurance, a separate executive position may be needed to lead this testing effort. For example, in addition to managing the End-to-End System Integration Test, Product Assurance is tasked with:

- Systems Acceptability Testing (SAT) responsibilities for upcoming filing season activities.
- Performing Year 2000 Certifications of components and systems.
- Ensuring the systems not undergoing End-to-End System Integration Testing are subjected to some form of end-to-end testing.

Recommendation

5. Information Systems should consider appointing an executive solely dedicated to leading the End-to-End System Integration Test Team. This may help ensure sufficient Servicewide authority and cross-functional coordination for the testing effort.

Review of the Internal Revenue Service's Year 2000 End-to-End
System Integration Test Efforts -
Overall Planning and Execution of Test I

Appendix VI



CHIEF INFORMATION OFFICER

DEPARTMENT OF THE TREASURY
INTERNAL REVENUE SERVICE
WASHINGTON, D.C. 20224

SEP 10 1998

RECEIVED

SEP 17 1998
9802522
Chief Inspector

MEMORANDUM FOR CHIEF INSPECTOR

FROM:

Toni L. Zimmerman *TLZ*
Deputy Chief Information Officer for
Information Resources Management IS:I

SUBJECT:

Review of the Service's Year 2000 End-to-End System
Integration Test (Overall Planning and Test I) -
Memorandum #1

The Director, Product Assurance Division has reviewed the subject memorandum and provides the management response attached.

If you have any questions, or need additional information, please feel free to call me at (202) 622-0260, or have a member of your staff call Donna Downing at (202) 283-4159.

Attachment

CONCUR:

Toni Zimmerman
TLZ

Chief Information Officer IS

9/11/98
Date

**Review of the Internal Revenue Service's Year 2000 End-to-End
System Integration Test Efforts -
Overall Planning and Execution of Test I**

**Response to Internal Audit Memorandum
Review of the Service's Year 2000 End-to-End System Integration Test (Overall
Planning and Test I) - Memorandum #1**

Recommendation 1

Information Systems should obtain formal agreements from testing partners for future testing activities. These agreements should be used to identify, prioritize, and allocate necessary resources. The agreements may be RISs for the Information Systems functions, or Memorandums of Understanding for the field and customer functions.

Assessment of Cause

Internal Audit stated, "No formal agreements have been made between the necessary parties for any phases of the End-to-End System Integration Test...Due to other Service priorities, including Service Center mainframe consolidation, there has been little technical support available to assist the Test Team in establishing the Unisys 2200 test environment at TCC."

Corrective Action for Recommendation 1

Product Assurance will, for all future test activities, issue Requests for Information Services (RIS), Memoranda of Understanding (MOU), and Service Level Agreements (SLA), as appropriate, with our project partners to formalize support agreements.

Implementation Date

Test 2	Completed:	Proposed: <u>October 9, 1998</u>
Test 3	Completed:	Proposed: <u>February 15, 1999</u>

Responsible Official

Chief Information Officer IS
Deputy Chief Information Officer for Information Resources Management IS:I
Director, Product Assurance Division IS:I:PA

**Review of the Internal Revenue Service's Year 2000 End-to-End
System Integration Test Efforts -
Overall Planning and Execution of Test I**

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Recommendation 2

Oversee the development of more detailed End-to-End System Integration Test plans and schedules. This should include, at a minimum, a Risk Management Plan that presents key testing risk areas and mitigation strategies, and plans that reflect the Year 2000 compliance of the Service's Tier II platforms and how the platforms' compliance will impact the End-to-End System Integration Test.

Assessment of Cause

Internal Audit found that additional detail should be included when: identifying specific risks or mitigation strategies; incorporating the Year 2000 compliance of the Service's Tier II platforms into the testing effort; and building support from the Systems Support Division into the test plans.

Corrective Action for Recommendation 2

Product Assurance has already begun this task. All plans submitted by the support contractor are under review. When reviews are complete, comments will be coordinated with the contractor and the documents will be delivered with more detail. A detailed schedule already exists and will be updated on a bi-weekly basis. The first bi-weekly update will be reflected in the August 28, 1998, bi-weekly progress review meeting.

Implementation Date

Completed:

Proposed: October 1, 1998

Responsible Official

Chief Information Officer IS
Deputy Chief Information Officer for Information Resources Management IS:I
Director, Product Assurance Division IS:I:PA

**Review of the Internal Revenue Service's Year 2000 End-to-End
System Integration Test Efforts -
Overall Planning and Execution of Test I**

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Recommendation 3

Improve communications between End-to-End System Integration Test partners through increased awareness of and interaction at Year 2000 End-to-End Test meetings and discussions.

Assessment of Cause

Similar to Recommendation 2, Internal Audit found that coordination with Partners will be critical for the remaining tests and that technical support was not always available in Test I. "Product Assurance has initiated steps to improve the level of proactive communications for the testing effort...We believe this type of communication effort is positive, and should be continued to help enhance communication for the overall testing effort and to ensure that accurate and effective information is being reported among the Test Team, Service executives, and external stakeholders."

Corrective Actions for Recommendation 3

Product Assurance has already begun this task. A TV satellite conference for field executives is scheduled for August 26, 1998. At this meeting, the Director of the Product Assurance Division will provide the field executives with an overview of the End to End Integration Test and the Year 2000 Certification Program. Field executives will be briefed on their role in supporting the test. In addition, bi-weekly program review meetings were initiated on August 13, 1998. These meetings will be attended by executives or their senior personnel with parts to play in the End to End Integration Test. The purpose of the meetings is to evaluate status, identify risks or delays and ensure there is general understanding of what is expected of each partner and ensure compliance.

1. Conduct Field and Customer satellite broadcast on August 26, 1998.

Implementation Date

Completed:

Proposed: August 26, 1998

**Review of the Internal Revenue Service's Year 2000 End-to-End
System Integration Test Efforts -
Overall Planning and Execution of Test I**

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Responsible Official

Chief Information Officer IS
Deputy Chief Information Officer for Information Resources Management IS:I
Director, Product Assurance Division IS:I:PA

2. Conduct bi-weekly meetings on End-to-End Testing with partners until the end of the test.

Implementation Date

Completed:

Proposed: December 31, 1999

Responsible Official

Chief Information Officer IS
Deputy Chief Information Officer for Information Resources Management IS:I
Director, Product Assurance Division IS:I:PA

Recommendation 4

Information Systems should develop an End-to-End System Integration Test Charter showing the members of the inter-organizational test team, the team's mission, and the team's roles and responsibilities. The team should consist of the key representatives from each of the partnering areas needed to effectively plan and conduct the End-to-End System Integration Test. The Team Charter should be communicated Servicewide to ensure awareness and accountability for the testing effort.

Assessment of Cause

Internal Audit identified that the End-to-End Test Team charter, listing partners from Information Systems and Field and Customer organizations with the mission, roles and responsibilities of the team must be formally identified and communicated Servicewide.

Corrective Action for Recommendation 4

The Product Assurance Division is currently completing the CONOPS for the End to End Integration Tests. This plan will provide the information described as deficient in this report.

**Review of the Internal Revenue Service's Year 2000 End-to-End
System Integration Test Efforts -
Overall Planning and Execution of Test I**

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Implementation Date

Completed:

Proposed: October 1, 1998

Responsible Official

Chief Information Officer IS

Deputy Chief Information Officer for Information Resources Management IS:I

Director, Product Assurance Division IS:I:PA

Recommendation 5

Information Systems should consider appointing an executive solely dedicated to leading the End-to-End System Integration Test Team. This may help ensure sufficient Servicewide authority and cross-functional coordination for the testing effort.

Assessment of Cause

Internal Audit states that "the Service's inter-organizational End-to-End System Integration Test Team should be led by an executive official, dedicated solely to the end-to-end test effort." Reasons given by Internal Audit for such an executive are as follows:

- 1) There is a need for an extensive cross-functional authority and Servicewide communication;
- 2) It is difficult to manage a project like this through a matrixed management approach;
- 3) There is a concern about organizational interests conflicting with activities that are required by end-to-end testing.
- 4) There are too many other significant priorities assigned to Product Assurance.

Corrective Action for Recommendation 5

Product Assurance agrees with the IA report as to the criticality of the End to End Integration Test. However, establishing an executive dedicated solely to End-to-End Testing would not necessarily alleviate any of the four areas of concern raised by Internal Audit. In fact, the current planning processes are progressing timely and in a coordinated effort with the partners, lead by Renee Shaw, Director of the Product Assurance Division. The End to End Integration testing is of the highest priority in the Service and the subject of twice monthly meetings with the Commissioner. In addition, the Chief Information Officer, the Deputy Chief Information Officers for Information Systems Resources and Systems Development, as well as the Director, Century Date Change Project Office are keenly aware of the needs of this test; follow its progress closely and support the Division's approach. Furthermore, a competent and seasoned

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testing Project Manager, reporting to Ms. Shaw, manages the End-to-End Integration testing on a full-time basis.

Implementation Date

Completed:

Proposed: No Corrective Action

Responsible Official

Chief Information Officer IS
Deputy Chief Information Officer for Information Resources Management IS:I
Director, Product Assurance Division IS:I:PA

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Appendix VII



DEPARTMENT OF THE TREASURY
INTERNAL REVENUE SERVICE
WASHINGTON, D.C. 20224

October 19, 1998

MEMORANDUM FOR CHIEF INFORMATION OFFICER



FROM: *for* Scott E. Wilson
Acting Assistant Chief Inspector (Internal Audit)

SUBJECT: Review of the Service's Year 2000 End-to-End System
Integration Test (Overall Planning and Test I Execution) –
Memorandum #2

As a part of our ongoing review of the Service's Year 2000 End-to-End System Integration Test effort, we are providing our interim results. We determined a detailed analysis and risk review of the Service's systems is needed to help support the End-to-End System Integration Test effort. We also identified a need for Operations to establish centralized oversight and control over the testing of key support systems.

If you do not agree with the facts, conclusions, or recommendations presented in this memorandum, please contact my office within five workdays. **We are not requiring a response to this memorandum at this time, because our Draft Report will be issued in the very near future. Your response to the issues in this memorandum should be incorporated into the Draft Report response.** If you have any questions concerning this memorandum, please contact me or Margaret Begg, Director of the Office of Audit Projects, at 703/235-4200.

Results

The primary goal of the Year 2000 End-to-End System Integration Test is to create an off-line test environment that replicates the Service's tax processing environment.

The Service's Year 2000 End-to-End System Integration Test is being controlled by the Information Systems Product Assurance function, with significant levels of contractor support. The primary goal of the Year 2000 End-to-End System Integration Test is to create an off-line test environment that replicates the Service's tax processing environment, including the tax processing pipeline, tax processing support systems, electronic tax

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filing, and the supporting hardware and telecommunications infrastructure.

Planning for the End-to-End System Integration Test began in May 1998, and testing will continue until December 1999. The test is ultimately intended to prove that tax-processing applications will perform correctly on and after January 1, 2000.

Systems not included in the coordinated End-to-End System Integration Test are expected to be tested locally for Year 2000 compliance using instructions prepared by the Product Assurance function. As of October 15, 1998, these instructions had not been finalized.

Systems not included in the coordinated End-to-End System Integration Test are expected to be tested locally for Year 2000 compliance using instructions prepared by the Product Assurance function. These instructions had not been finalized as of October 15, 1998.

During our on-going review of the Year 2000 End-to-End System Integration Test, we identified the following issues that we believe need to be addressed:

- The Year 2000 End-to-End System Integration Testing effort would benefit from a detailed analysis and risk review of the Service's systems.
- Additional management attention is needed to ensure key Operations support systems, not selected for the coordinated End-to-End System Integration Test, receive appropriate levels of emphasis and resources.

A detailed analysis and risk review of the Service's systems is needed to help support the End-to-End System Integration Testing process.

The Year 2000 End-to-End System Integration Test being coordinated by Product Assurance represents the Service's commitment to ensure its most critical systems are extensively tested for Year 2000 compliance. However, Product Assurance's selection of the systems for inclusion in this test was primarily judgmental. Management did not perform a detailed risk analysis or in-depth review of the systems prior to their selection. Our analysis identified several systems, not selected for the End-to-End System Integration Test, that have similar risk attributes to selected systems. There is no

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documentation regarding why these systems were not selected.

The General Accounting Office Year 2000 Computing Crisis Testing guide requires that End-to-End System Integration Testing be accompanied by an analysis of an organization's core business functions. In addition, interrelationships among systems supporting these functions should be analyzed as well as the potential risk exposure due to failure of any system in the chain of support.

A detailed analysis of the business value and potential risk exposure of all major Service systems would provide benefit throughout the entire End-to-End System Integration Test process.

Although the systems to be included in the coordinated test have already been selected, we believe a detailed analysis of the business value and potential risk exposure of all major Service systems would provide benefit throughout the entire End-to-End System Integration Test process. Ongoing benefits of this analysis would include the ability to:

- Prioritize the End-to-End System Integration Test being coordinated by the Product Assurance function, which could be critical in the event of unforeseen difficulties or schedule slippage.
- Establish precedence for the testing of systems not selected for the Product Assurance coordinated test, which would ensure systems with a higher business value receive priority access to limited resources.
- Identify all key Operations support systems not selected for testing.

Recommendation

Management should:

1. Perform a detailed analysis of the business value and potential risk exposure of all major Service systems and establish a priority ranking.

Operations needs to establish centralized oversight and control over the testing of key support systems.

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Additional management attention is needed to ensure key Operations support systems not selected for the coordinated End-to-End System Integration Test are identified and receive sufficient emphasis and resources. Presently, the owners of these systems are expected to perform their own testing based on instructions received from the Product Assurance function. There is no centralized oversight within Operations for this process.

There is no centralized oversight for the End-to-End System Integration Test within the Operations area.

Some of the key Operations systems not selected for the coordinated End-to-End System Integration Test include those responsible for controlling cases and initiating transactions related to the processing of EPEO Determinations, Bankruptcies, and Offers in Compromise. The General Accounting Office Year 2000 Computing Crisis Testing Guide stresses that, to be done effectively, Year 2000 testing should be conducted in a structured and disciplined fashion. Additionally, organizational authority and responsibility needs to be clearly and formally defined within the respective organizational components.

Additional benefit could also be gained by mandating the use of the Product Assurance test bed for the review of all key Operations support systems not selected for coordinated testing. This would ensure these systems are analyzed for Year 2000 compliance in a secure and controlled environment. Use of the Product Assurance test bed for non-selected systems is currently optional for the system owners whose systems are not included in the End-to-End System Integration Test.

Recommendation

Management should:

2. Identify all key Operations support systems not selected for the nationally coordinated End-to-End System Integration Test.
3. Establish, within the Operations function, centralized oversight and control over the testing of key support systems.

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4. Mandate that key Operations systems owners use the Product Assurance test bed to perform their Year 2000 compliance testing.

Deputy Commissioner Operations
Chief, Management and Finance